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(54) NUTRITION-SUPPLYING FOOD CONTAINING NATURAL VITAMIN C IN HIGH UNIT

(57)Abstract:

PURPOSE: To provide a nutrition providing food having natural vitamin C prepared from fruit juice of acerola as a raw material in high units and in a high state.

CONSTITUTION: A nutrition providing food containing natural-occurring vitamin C in high units prepared by blending a stock solution of fruit juice of acerola with a solution of acetic acid to $\geq 1.5\%$ acidity and concentrating the solution ≥ 2.0 acidity by low-temperature vacuum distillation method.

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CLAIMS

[Claim(s)]

[Claim 1] The enriched food which comes to contain the natural vitamin C characterized by condensing and obtaining to 2.0% or more of acidity by the low-temperature vacuum distillation method after mixing acetic-acid liquid and adjusting acidity to 1.5% or more into the undiluted solution of acerola fruit juice per high.

[Claim 2] The enriched food which comes to contain the natural vitamin C which comes further to carry out desiccation disintegration of the acerola fruit-juice concentration liquid condensed and obtained to 2.0% or more of acidity by the

low-temperature vacuum distillation method after mixing acetic-acid liquid and adjusting acidity to 1.5% or more into the undiluted solution of acerola fruit juice by the freezing vacuum-drying method per high.

[Claim 3] The enriched food with which acetic-acid liquid comes to contain the natural vitamin C according to claim 1 or 2 which distills and obtains brown rice vinegar by the low-temperature vacuum distillation method per high.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the enriched food which is a stable state and comes to contain natural vitamin C per high.

[0002]

[Description of the Prior Art] The alimentation top vitamin has an important role. Especially, vitamin C is an important vitamin with an antioxidation operation, and is important nourishment indispensable to maintaining human being's life. Although people are taking in vitamin C from vegetables or fruit, since it will be easy to disassemble them if the water soluble powders of vitamin C touch light, heat, and air, intake of sufficient vitamin C is made very much difficult. Although the criteria of the initial complement on the 1st of vitamin C are determined as 60mg by the man-and-woman adult at the Ministry of Health and Welfare, in order to maintain health, it is supposed that 1g intake will be required on 1. Since especially vitamin C has the important function to stop the oxidation, the intake of a lot of is needed for the drinking person or the smoker. Although it is not necessary to take in as food since animals, such as a dog and a rat, biosynthesize vitamin C in a body, people do not have the ability.

[0003] Although the so-called problem of dotage is a serious social problem on the other hand recently, the research result which should be observed if this dotage and vitamin C have a close relation is also released. That is, vitamin C serves as a raw material of matter called a collagen, and a collagen is a principal component which connects not only the skin, a bone, muscles, and a blood vessel but also cells of the heart, liver, the kidney, etc., such as all organizations, organs, etc. If this collagen does not exist, since a cell becomes scattering, it will be the very important matter. The glia currently generally used for adhesives is also made of the collagen. Although the

collagen is building the blood vessel which were rich in resiliency in the blood vessel, if vitamin C runs short, a collagen decreases, a blood vessel becomes weak, arteriosclerosis will be started or blood pressure will rise. Moreover, the collagen constitutes the film which wraps the brain of the membrana cerebri. If vitamin C is insufficient and a collagen is no longer built fully, work of the membrana cerebri becomes blunt, work of a cerebral nerve cell will also fall, memory, thinking power, judgment, etc. will become blunt, and the so-called dotage symptom will occur. Therefore, an old man needs to take in many vitamin C than a young man.

[0004] Moreover, it is also already checked that vitamin C has the operation which suppresses growth of the neoplasm of an animal. According to the data with which British surgeon Cameron measured the level of the vitamin C of the inside of the body of the gun patient of the last stage which is in its hospital, compared with health people, the level in a gun patient's blood showed the value of about 1/4. That is, to about 1mg vitamin C being in 1 deciliter of health people's blood, patients are few, or are 0.26mg, and the level says that it was severe and they were low. The incidence rate of a gun is high to a person with disagreeable vegetables, and vitamin C is an absolutely required nutrient at prevention of a gun. The polling which is the biochemist of the United States which won the Nobel Prize twice is illness to which especially a gun increases the initial complement of vitamin C also among "illnesses. however, human being needs to build vitamin C in a body — since there is nothing, if vitamin C is not compensated in large quantities in the case of a gun patient, it will be in the same condition as the scurvy of avitaminosis C, and will die and result in it — " — it is ****(ing).

[0005] Thus, although vitamin C is very important on health, it is impossible to also take in 1g per day of vitamin C of the natural mold contained in vegetables, fruit, etc. in practice, therefore the present condition is taking in the ascorbic acid which compounds and is chemically obtained from the water solution of grape sugar as vitamin C conventionally.

[0006]

[Problem(s) to be Solved by the Invention] As mentioned above, in order to take in the initial complement of the vitamin C per day conventionally, it depended on the ascorbic acid compounded chemically. However, there is nothing that excels the natural vitamin C by which vitamin C is extracted from activity **** food. Every day, by the intake only from food, this invention person paid his attention to the fruit juice of the fruit of the point of origin and the acerola from the tropical United States (a kind of the tropical fruit belonging to ACEROLA and the department of KINTORAO)

made for there to be most contents of vitamin C in the vegetation known now, as a result of studying many things in order to obtain the enriched food which became insufficient and contained natural vitamin C [win] per high. Although the vitamin C contained in the fruit juice of the fruit of an acerola is made into 28 or more times of lemon, vitamin C has been originally made difficult [manufacture of the enriched food of natural vitamin C] till today that light, heat, and air are easy to be destroyed. Especially the concentration liquid of acerola fruit juice has a serious trouble of a suspended matter generating and foaming into concentration liquid only by leaving it on several that it is easy to ferment by contacting air, and stopping bearing use.

[0007] As described above, although the fruit juice of an acerola contained a lot of vitamin C, it was difficult to be easy to carry out deterioration and to hold the vitamin C to contain to a stable state under ordinary temperature except refrigeration. Then, it used to come to make header this invention for this invention person raising the acidity of an acerola fruit-juice undiluted solution using the acetic-acid liquid which distilled and obtained brown rice vinegar, suppressing destruction of vitamin C as much as possible paying attention to having the special feature by which vitamin C is stabilized under existence of an acid, and vitamin C being held to a stable state. therefore, the natural vitamin C which the purpose of this invention becomes considering acerola fruit juice as a raw material — a high unit — and it is in offering the enriched food held to the stable state.

[0008]

[Means for Solving the Problem] If the configuration of this invention for attaining said purpose is explained in full detail, invention concerning claim 1 After mixing acetic-acid liquid and adjusting acidity to 1.5% or more into the undiluted solution of acerola fruit juice, Are the enriched food which comes to contain the natural vitamin C characterized by condensing and obtaining to 2.0% or more of acidity by the low-temperature vacuum distillation method per high, and invention concerning claim 2 After mixing acetic-acid liquid and adjusting acidity to 1.5% or more into the undiluted solution of acerola fruit juice, it is the enriched food which comes to contain the natural vitamin C which comes further to carry out desiccation disintegration of the acerola fruit-juice concentration liquid condensed and obtained to 2.0% or more of acidity by the low-temperature vacuum distillation method by the freezing vacuum-drying method per high. Moreover, invention concerning claim 3 is an enriched food with which acetic-acid liquid comes to contain the natural vitamin C according to claim 1 or 2 which distills and obtains brown rice vinegar by the low-temperature vacuum distillation method per high.

[0009] According to the data of Japan fruits processing incorporated company in the component of the undiluted solution of acerola fruit juice, for acidity, amino nitrogen content % and ash content of 18.53mg are [a sugar content / 0.32g/100g, the 1735.83 mg content of vitamin C / 100g, and pH] 3.22 1.29% 10.47%. This undiluted solution will be in the condition of carrying out turbidity foaming several days after, and not bearing use, if the concentration liquid which was saved in the state of refrigeration, thawed this, and usually left under ordinary temperature with the undiluted solution, or was condensed and obtained by the low-temperature vacuum distillation method is left under ordinary temperature. On the other hand, if acetic-acid liquid, especially the acetic-acid liquid which distilled and obtained brown rice vinegar by the low-temperature vacuum distillation method are mixed in the undiluted solution of acerola fruit juice and acidity is raised, it will become fruit juice which a rapid change did not take place with time, but was mostly stabilized by the content of vitamin C.

[0010]

[Example] Hereafter, the example of this invention is combined with the example of a comparison, and it explains to a detail. In addition, analysis of the content of vitamin C calls at a foundation method man-day book food analysis pin center, large.

[Example 1] As acidity adjustment liquid of an acerola fruit-juice undiluted solution, brown rice vinegar (acidity [of 4.3%] and amino nitrogen content % of 150mg) was distilled by the low-temperature vacuum distillation method, and acetic-acid liquid of 5% of acidity was prepared. Next, the acidity of 4.53%, the content of 2870mg of vitamin C / 100g acerola fruit-juice concentration liquid was obtained for acerola fruit juice of 1.6% of acidity which mixed and obtained 2l. of acetic-acid liquid prepared into 6l. (1.29% of acidity) of acerola fruit-juice undiluted solutions which carried out defrosting processing by the low-temperature vacuum distillation method. This fruit-juice concentration liquid was further condensed to the limitation of concentration of a low-temperature vacuum distillation method, and the acidity of 10.5%, the content of 14300mg of vitamin C / 100g acerola fruit-juice concentration liquid of a high unit was obtained. When aging of this acerola fruit-juice concentration liquid was observed, abnormalities were not accepted at all. That is, it becomes possible to take in about 1g of natural vitamin C needed on health maintenance by taking in ten cc per time 3 times per day, or 4 times in acerola fruit-juice concentration liquid of 4.53% of acidity of this invention per day.

[Example 2] 4l. of acetic-acid liquid prepared in said example 1 to 6l. of thawed acerola fruit-juice undiluted solutions was mixed, it adjusted to acerola fruit juice of 3% of acidity, and the acidity of 6.48%, the content of 3850mg of vitamin C / 100g acerola

fruit-juice concentration liquid was obtained by the low-temperature vacuum distillation method. Furthermore, it condensed to the limitation of concentration of this acerola fruit-juice concentration liquid of a low-temperature vacuum distillation method, and the acidity of 10.8%, the vitamin-C content of 15500mg / 100g acerola fruit-juice concentration liquid of a high unit was obtained. When aging of this acidity of 6.48% and 10.8% of both acerola fruit-juice concentration liquid was observed, abnormalities were not accepted at all. Moreover, desiccation disintegration of the acerola fruit-juice concentration liquid of 10.8% of this acidity was further carried out by the freezing vacuum-drying method, and the enriched food which contains natural vitamin C per high was obtained.

[0011] [Example 1 of a comparison] The acerola fruit juice of a frozen condition was thawed, the acerola fruit-juice undiluted solution with the undiluted solution which does not carry out acidity adjustment with the acetic-acid liquid of this invention was condensed to the limitation of concentration by the low-temperature vacuum distillation method, and the acidity of 9.0%, the content of 12900mg of vitamin C / 100g acerola fruit-juice concentration liquid was obtained. However, this concentration liquid presented the foaming condition several days after. And as compared with the concentration liquid of an example 1, no less than 2600mg of contents of vitamin C is carrying out fall reduction among 100g, compared with examples 1 and 2, it is shown that vitamin C carries out destructive disappearance during distillation, and the effectiveness of adjusting the acidity of acerola undiluted solution fruit juice with the acetic-acid liquid of this invention is proved.

[Example 2 of a comparison] 4l. (4.3% of acidity) of raw brown rice vinegar is mixed in 20l. (the acidity of 1.29%, the vitamin-C content of 1735mg / 100g) of thawed acerola fruit-juice undiluted solutions. Although it adjusted to the acerola fruit juice which has 1.68% of acidity, it condensed to the limitation of concentration by the low-temperature vacuum distillation method and the acidity of 9.9%, the content of 13000mg of vitamin C / 100g acerola fruit-juice concentration liquid was obtained. As compared with concentration liquid of 10.8% of acidity of an example 2, the content of vitamin C is falling by no less than 2500mg among 100g. And this concentration liquid produced air bubbles in several days after concentration, and ended in failure.

Generating of these air bubbles and reduction of the vitamin C in concentration liquid originate in the vitamin C in acerola fruit juice having caused the enzyme and chemical reaction in raw brown rice vinegar, and the effectiveness of the acetic-acid liquid of this invention as acidity adjustment liquid of an acerola fruit-juice undiluted solution is proved.

[0012]

[Effect of the Invention] as mentioned above, the natural vitamin C which becomes considering acerola fruit juice as a raw material when based on this invention -- a high unit -- and the alimentation concentration liquid and the powder which were held to the stable state can be offered, and this can be diluted suitably, and it can consider as a soft drink, and can be made to be able to sink in into food, and can apply as an enriched food etc.

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(54)【発明の名称】 天然のビタミンCを高単位に含有してなる栄養補給食品

(57)【要約】

【目的】 アセロラ果汁を原料とした天然のビタミンCを高単位に且つ安定状態に保持した栄養補給食品を提供する。

【構成】 アセロラ果汁の原液中に酢酸液を混合して

1. 5%以上に酸度を調整した後、低温真空蒸留法で
2. 0%以上の酸度に濃縮して得た天然のビタミンCを高単位に含有してなる栄養補給食品。

【特許請求の範囲】

【請求項1】 アセロラ果汁の原液中に酢酸液を混合して1. 5%以上に酸度を調整した後、低温真空蒸留法で2. 0%以上の酸度に濃縮して得たことを特徴とする天然のビタミンCを高単位に含有してなる栄養補給食品。

【請求項2】 アセロラ果汁の原液中に酢酸液を混合して1. 5%以上に酸度を調整した後、低温真空蒸留法で2. 0%以上の酸度に濃縮して得たアセロラ果汁濃縮液を更に凍結真空乾燥法で乾燥粉末化してなる天然のビタミンCを高単位に含有してなる栄養補給食品。

【請求項3】 酢酸液が玄米食酢を低温真空蒸留法で蒸留して得たものである請求項1または請求項2記載の天然のビタミンCを高単位に含有してなる栄養補給食品。

【発明の詳細な説明】

【0001】

【産業上の利用分野】本発明は天然のビタミンCを安定状態で且つ高単位に含有してなる栄養補給食品に関するものである。

【0002】

【従来の技術】栄養補給上ビタミンは重要な役割を持っている。中でもビタミンCは抗酸化作用をもつ重要なビタミンであり、人間の生命を維持するのに欠くことのできない重要な養分である。人はビタミンCを野菜や果物から摂取しているが、ビタミンCの水溶剤は、光や熱、空気に触れると分解し易いので充分なビタミンCの摂取はなかなか困難であるとされている。厚生省ではビタミンCの1日の必要量の基準を男女成人で60mgと定めているが、健康を維持するためには1日に1gの摂取が必要であるとされている。特に、ビタミンCは酸化作用を抑える重要な機能を有するので、飲酒者や喫煙者にとってはその多量の摂取が必要とされている。イヌやネズミなどの動物はビタミンCを体内で生合成するので食物として摂取する必要がないが、人にはその能力がない。

【0003】一方、最近いわゆるボケの問題が深刻な社会問題となっているが、このボケとビタミンCが密接な関係にあると注目すべき研究結果も発表されている。すなわち、ビタミンCはコラーゲンという物質の原料となるものであり、コラーゲンは皮膚や骨、筋肉、血管はもとより心臓、肝臓、腎臓などのあらゆる組織や臓器などの細胞を繋ぎ合わせる主成分である。このコラーゲンがなければ細胞はバラバラになるのできわめて大切な物質である。一般的に接着剤に使用されている膠もコラーゲンからできている。血管にはコラーゲンが多く弾力性に富んだ血管をつくっているが、ビタミンCが不足するとコラーゲンが減少して血管が脆くなり、動脈硬化を起したり血圧が上昇したりする。また、コラーゲンは脳膜という脳を包む膜を構成している。ビタミンCが不足してコラーゲンが充分につくられなくなると、脳膜の働きが鈍って脳の神経細胞の働きも低下して記憶力や思考力、判断力などが鈍り、いわゆるボケ症状が発生するの

である。従って、老人は若人よりも多くのビタミンCを摂取することが必要である。

【0004】また、ビタミンCには動物の腫瘍の増殖を抑える作用があることもすでに確認されている。イギリスの外科医キャメロンが自分の病院に入院している末期のガン患者の体内のビタミンCのレベルを測ったデータによると、健康人に較べてガン患者の血液中のレベルは約4分の1の値を示していた。すなわち、健康人の血液1デシリットルの中には約1mgのビタミンCがあるのに対して、患者達は僅か0.26mgで、そのレベルがひどく低かったという。野菜嫌いの人にガンの発生率が高く、ガンの予防にビタミンCは絶対必要な栄養素である。ノーベル賞を2度受賞したアメリカの生化学者であるポーリングは、『病気のうちでもガンは特にビタミンCの必要量を増大させる病気である。ところが人間は体内でビタミンCをつくれないから、ガン患者の場合ビタミンCを大量に補ってやらなければ、ビタミンC欠乏症の壊血病と同じ状態になって死に到る』と説論している。

【0005】このようにビタミンCは保健上きわめて重要であるが、野菜や果物などに含まれる天然型のビタミンCを1日当たり1gも摂取することは實際上不可能で、そのため従来は化学的にぶどう糖の水溶液から合成して得られるアスコルビン酸をビタミンCとして摂取しているのが現状である。

【0006】

【発明が解決しようとする課題】上記のように、従来は1日当たりのビタミンCの必要量を摂取するため化学的に合成されたアスコルビン酸に頼っていた。しかしながら、ビタミンCは活性ある食物から抽出される天然のビタミンCに勝るものはない。本発明者は、日常、食物からだけの摂取では不足となり勝ちな天然のビタミンCを高単位に含有した栄養補給食品を得るべく種々研究した結果、現在知られている植物の中では最もビタミンCの含有量が多いとされる原産地・熱帯アメリカ産のアセロラ(ACEROLA、キントラオ科に属するトロピカルフルーツの一種)の実の果汁に着目した。アセロラの実の果汁に含まれるビタミンCはレモンの28倍以上とされているが、元来ビタミンCは光、熱、空気によって破壊され易く天然のビタミンCの栄養補給食品の製造は今日まで困難とされてきた。特に、アセロラ果汁の濃縮液は空気と接触することにより醗酵し易く数日放置しただけで濃縮液中に濁質が生成し、発泡して使用に堪えなくなるという重大な問題点がある。

【0007】前記したように、アセロラの果汁は多量のビタミンCを含有しているものの冷凍以外常温下では変敗し易く、含有するビタミンCを安定状態に保持するのが困難であった。そこで、本発明者はビタミンCが酸の存在下において安定する特質をもつことに着目し、玄米食酢を蒸留して得た酢酸液を利用して、アセロラ果汁原

液の酸度を高めビタミンCの破壊を極力抑えて、ビタミンCを安定状態に保持し得ることを見出し本発明をなすに到ったものである。したがって、本発明の目的はアセロラ果汁を原料としてなる天然のビタミンCを高単位に且つ安定状態に保持した栄養補給食品を提供することにある。

【0008】

【課題を解決するための手段】前記目的を達成するための本発明の構成を詳述すれば、請求項1に係る発明は、アセロラ果汁の原液中に酢酸液を混合して1.5%以上10に酸度を調整した後、低温真空蒸留法で2.0%以上の酸度まで濃縮して得たことを特徴とする天然のビタミンCを高単位に含有してなる栄養補給食品であり、請求項2に係る発明は、アセロラ果汁の原液中に酢酸液を混合して1.5%以上に酸度を調整した後、低温真空蒸留法で2.0%以上の酸度に濃縮して得たアセロラ果汁濃縮液を更に凍結真空乾燥法で乾燥粉末化してなる天然のビタミンCを高単位に含有してなる栄養補給食品である。また、請求項3に係る発明は、酢酸液が玄米食酢を低温真空蒸留法で蒸留して得たものである請求項1または請求項2記載の天然のビタミンCを高単位に含有してなる栄養補給食品である。

【0009】アセロラ果汁の原液の成分は、日本果実加工株式会社資料によると、糖度が10.47%、酸度が1.29%、アミノ態窒素含有量18.53mg%、灰分が0.32g/100g、ビタミンCの含有量1735.83mg/100g、pHが3.22である。この原液は通常、冷凍状態で保存されており、これを解凍して原液のまま常温下に放置するか、または低温真空蒸留法にて濃縮して得た濃縮液を常温下に放置すると数日後には混濁発泡して使用に堪えない状態となる。これに対し、酢酸液、特に玄米食酢を低温真空蒸留法にて蒸留して得た酢酸液を、アセロラ果汁の原液中に混合して酸度を高めてやると、経時的にも急速な変化は起こらずビタミンCの含有量もほぼ安定した果汁となる。

【0010】

【実施例】以下、本発明の実施例を比較例と併せて詳細に説明する。なお、ビタミンCの含有量の分析は、財団法人日本食品分析センターによるものである。

【実施例1】アセロラ果汁原液の酸度調整液として、玄米食酢（酸度4.3%、アミノ態窒素含有量150mg%）を低温真空蒸留法で蒸留して、酸度5%の酢酸液を用意した。次に、解凍処理したアセロラ果汁原液（酸度1.29%）6リットル中に、用意した酢酸液2リットルを混入して得た酸度1.6%のアセロラ果汁を、低温真空蒸留法で酸度4.53%、ビタミンCの含有量2870mg/100gのアセロラ果汁濃縮液を得た。この果汁濃縮液をさらに低温真空蒸留法の濃縮の限界まで濃縮して、酸度10.5%、ビタミンCの含有量14300mg/100gの高単位のアセロラ果汁濃縮液を得

た。このアセロラ果汁濃縮液の経時変化を観察したところ全く異常は認められなかった。すなわち、本発明の酸度4.53%のアセロラ果汁濃縮液を1日当たり3回または4回、1回当たり10ccを摂取することによって健康保持上必要とされる天然のビタミンCを、1日約1g摂取することが可能となる。

【実施例2】解凍したアセロラ果汁原液6リットルに対し前記実施例1で用意した酢酸液4リットルを混合して、酸度3%のアセロラ果汁に調整して、低温真空蒸留法で酸度6.48%、ビタミンCの含有量3850mg/100gのアセロラ果汁濃縮液を得た。さらにこのアセロラ果汁濃縮液を低温真空蒸留法の濃縮の限界まで濃縮して、酸度10.8%、ビタミンC含有量15500mg/100gの高単位のアセロラ果汁濃縮液を得た。この酸度6.48%、10.8%の両アセロラ果汁濃縮液の経時変化を観察したところ、全く異常が認められなかった。また、この酸度10.8%のアセロラ果汁濃縮液を更に凍結真空乾燥法で乾燥粉末化して、天然のビタミンCを高単位に含有する栄養補給食品を得た。

【0011】【比較例1】冷凍状態のアセロラ果汁を解凍して、本発明の酢酸液で酸度調整しない原液のままのアセロラ果汁原液を、低温真空蒸留法で濃縮の限界まで濃縮して、酸度9.0%、ビタミンCの含有量12900mg/100gのアセロラ果汁濃縮液を得た。しかしながら、この濃縮液は数日後に発泡状態を呈した。しかも、実施例1の濃縮液に比較してビタミンCの含有量が100g中2600mgも低下減少していて、実施例1および2に比べ蒸留中にビタミンCが破壊消失することを示し、本発明の酢酸液でアセロラ原液果汁の酸度を調整することの有効性を証明するものである。

【比較例2】解凍したアセロラ果汁原液（酸度1.29%、ビタミンC含有量1735mg/100g）20リットルに生玄米食酢（酸度4.3%）4リットルを混入して、1.68%の酸度を有するアセロラ果汁に調整し、低温真空蒸留法で濃縮の限界まで濃縮して、酸度9.9%、ビタミンCの含有量13000mg/100gのアセロラ果汁濃縮液を得たが、実施例2の酸度10.8%の濃縮液に比較してビタミンCの含有量が100g中2500mgも低下している。しかも、この濃縮液は濃縮後数日で気泡を生じ失敗に終わった。この気泡の発生と濃縮液中のビタミンCの減少はアセロラ果汁中のビタミンCが、生玄米食酢中の酵素と化学反応を起こしたことに基因するもので、アセロラ果汁原液の酸度調整液としての本発明の酢酸液の有効性が証明される。

【0012】

【発明の効果】以上のように、本発明によった場合はアセロラ果汁を原料としてなる天然のビタミンCを高単位に且つ安定状態に保持した栄養補給濃縮液及び粉末を提供することができ、これを適宜希釈して清涼飲料として、また食品中に含浸させて栄養補給食品などとして応

用することができるものである。

フロントページの続き

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